

Thunder-storms were also reported from the following stations not included in the districts named above:

- 4th.—Roseburg and Albany, Oregon.
5th.—Roseburg, Oregon, Fort Lapwai, Idaho, and Salt Lake City, Utah.
6th.—Salt Lake City, Utah.
10th.—Fort Totten, Dakota, and Nephi, Utah.
12th.—Fort Buford, Dakota.
18th.—Los Angeles, Poway, and San Diego, California.
19th.—Poway, California.
21st.—Carson City, Nevada.
30th.—Nephi, Utah.

OPTICAL PHENOMENA.

SOLAR HALOS.

Solar halos have been observed in the various districts on the following dates:

New England.—6th, 10th, 11th, 12th, 15th, 17th, 19th to 22d, 24th, 28th.

Middle Atlantic states.—5th, 6th, 8th, 10th, 11th, 14th, 16th, 18th to 21st, 28th.

South Atlantic states.—11th, 15th, 18th, 21st, 28th.

Western Gulf.—5th, 6th, 7th, 9th, 14th, 15th, 19th, 20th, 27th, 28th.

Tennessee.—7th, 8th, 13th, 16th, 28th.

Lower lakes.—12th, 16th, 19th, 20th, 28th.

Middle Slope.—9th, 15th, 27th, 28th, 29th.

Solar halos were also observed at the following stations not included in the districts named above:

California.—San Francisco, 10th, 21st, 24th, 27th to 30th.

Florida.—Key West, 25th, 27th; Pensacola, 12th, 24th.

Idaho.—Fort Lapwai, 14th.

Illinois.—Anna, 28th; Cairo, 4th; Riley, 6th, 19th.

Indiana.—Vevay, 29th; Wabash, 5th.

Iowa.—Keokuk, 7th.

Kansas.—Fort Scott, 27th.

Michigan.—Alpena, 29th; Grand Haven, 27th.

Minnesota.—Saint Vincent, 24th.

Mississippi.—Vicksburg, 19th.

Ohio.—Columbus, 12th.

Texas.—Fort Stockton, 18th.

Utah.—Nephi, 16th; Salt Lake City, 11th, 24th.

Washington Territory.—Dayton, 8th; Fort Canby, 16th.

LUNAR HALOS.

Lunar halos have been observed in the various districts on the following dates:

New England.—10th to 14th, 16th, 19th, 20th, 22d.

Middle Atlantic states.—9th to 14th, 16th to 22d.

South Atlantic states.—10th, 12th, 14th, 17th, 18th, 19th.

Eastern Gulf.—8th, 12th, 15th, 16th, 19th.

Western Gulf.—9th to 20th.

Tennessee.—10th, 12th, 14th, 16th, 19th.

Ohio valley.—10th, 12th, 13th, 16th.

Lower lakes.—11th to 14th, 17th to 20th.

Upper lakes.—11th to 17th, 19th.

Upper Mississippi valley.—7th, 14th, 15th.

Missouri valley.—9th, 10th, 12th, 13th, 14th, 19th.

Lunar halos were also observed at the following stations, not included in the districts named above:

Arizona.—Prescott, 10th.

California.—San Francisco, 15th.

Colorado.—West Las Animas, 9th.

Dakota.—Bismarek, 17th; Fort Totten, 28th.

Florida.—Sanford, 14th, 15th.

Kansas.—Salina, 14th; Yates Centre, 9th.

Nebraska.—North Platte, 14th.

Ohio.—Columbus, 18th.

Oregon.—Albany, 15th.

Pennsylvania.—Pittsburg, 11th.

Texas.—Brownsville, 17th; Fort Concho, 17th; Fort Stockton, 11th.

Utah.—Nephi, 16th.

Washington Territory.—Fort Canby, 10th.

MIRAGE.

Block Island, Rhode Island, 26th.—The main land at Point Judith was visible to-day from 7 a. m. to 4.30 p. m.

Salina, Kansas, 19th, 24th, 28th.

Indianola, Texas, 16th, 23d, 24th.

MISCELLANEOUS PHENOMENA.

SUNSETS.

The characteristics of the sky, as indicative of fair or foul weather for the succeeding twenty-four hours, have been observed at all Signal Service stations. Reports from one hundred and forty-one stations show 4,203 observations to have been made, of which three were reported doubtful; of the remainder, 4,200, there were 3,660, or 87.2 per cent., followed by the expected weather.

SUN SPOTS.

The following record of sun spots for the month of September, 1883, has been forwarded by Professor D. P. Todd, Director of the Lawrence observatory, Amherst, Massachusetts:

Date— Sept., 1883.	No. of new		Disappeared by solar rotation.		Reappeared by solar rotation.		Total No. visible.		Remarks.
	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	Gr'ps	Spots	
1, 8 a. m.	1	20†	0	10†	1	3	7	95†	
2, 9 a. m.	1	10†	2	5	1	5	6	80†	
3, 10 a. m.	1	3	0	10†	1	1	7	55†	
4, 10 a. m.	1	1	1	5	1	1	7	40†	
5, 9 p. m.	0	0	1	4	0	0	5	30†	
6, 5 p. m.	0	0	0	5	0	0	5	20†	
9, 10 a. m.	1	6			1	6	0	20†	One of the spots very large.
10, 4 p. m.	2	13†		2	1	3	6	30†	Do.
11, 4 p. m.	0	10†	1	3	0	2	5	35†	Do.
15, 12 m.	3	15†					6	50†	
16, 10 a. m.	0	0		3	0	0	5	45†	
18, 5 p. m.	0	0			0	0	5	25†	Broad areas of facule.
19, 11 a. m.	0	0	0	5	0	0	4	20†	
21, 4 p. m.	0	0	2	10†	0	0	2	10†	Veiled spots.
22, 11 a. m.	1	3	0	3	0	0	2	10†	Do.
25, 3 p. m.	0	0			0	0	0	0	
26, 11 a. m.	3	8	0	0	1	2	3	8	Do.
27, 3 p. m.	0	0	0	0	0	0	2	6	Do.

Facule were seen at the time of every observation. † Approximated.

Mr. William Dawson, of Spiceland, Indiana, reports having observed sun spots during September, as follows:

1st.—Seven groups, ninety spots; one group of six prominent spots, three of which were quite large, appeared in the southeast quadrant.

3d.—Eight groups, sixty-six spots; one spot 9,000 miles long and 6,500 miles wide was faintly visible to the naked eye.

5th.—Six groups, sixty spots; the large spot observed on the 3d appeared much broken.

10th.—Five groups, fifty spots; one of which was visible to the naked eye.

13th.—The large spot seen on the 10th was still plainly visible without the telescope.

14th.—Six groups, eighty spots; the large spot before mentioned was much broken on this date, but it was still visible to the naked eye.

19th.—Four groups, forty spots.

21st.—Two groups, seventeen spots, fourteen of which were near the western edge.

24th.—Three groups, seven small spots.

26th.—Two groups, seven spots; one large spot at east edge.

28th.—Four groups, seventeen spots.

29th.—Five groups, twenty-two spots, all of which, with one exception, were very small.

Mr. H. D. Goway, at North Lewisburg, Ohio, reports that sun spots were observed at that place on all clear days during the month.

The s. s. "Hevelius," on the 10th and 11th, at Bahia, Brazil, and from the 12th in S. 11° 00', W. 35° 30', to the 21st, in N. 27° 07', W. 21° 30'; observed daily a large spot on the sun, which disappeared on the last-named date.

The s. s. "Llandaff City" observed sun spots, as follows: